EXHIBIT 7.II

MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)

REVISED July 22, 2003

MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)

7.II - 1.0 INTRODUCTION

The Model Water Quality Management Plan (Model WQMP) has been developed to address post-construction urban runoff and stormwater pollution from all new development and significant redevelopment projects. The goal for use of the Model WQMP is to achieve practicable and enforceable policies to minimize the effects of urbanization on site hydrology, urban runoff flow rates or velocities and pollutant loads. This goal may be achieved through site-specific project-based controls, or a combination of project-based and regionally or watershed-based controls.

This Model WQMP identifies appropriate controls, commonly referred to as Best Management Practices (BMPs), for all applicable projects and will be reviewed and approved by the Santa Ana Regional Water Quality Control Board. The Santa Ana Regional Boardwill solicit public review and comment prior to approval. The San Diego Regional Water Quality Control Board will review the Model WQMP for compliance with the NPDES Permit (Order R9-2002-001). Permittees are required to adopt their own local WQMP (see **DAMP, Appendix A-7**) based on the Regional Board-approved Model WQMP and may adapt the Model WQMP for local conditions. The requirements apply to both private and public agency projects.

Using the local WQMP as a guide, each Permittee will approve project-specific Water Quality Management Plans (Project WQMPs) as part of the development plan and entitlement approval process or the ministerial permit approval process for Priority and Non-Priority Projects as defined in **DAMP Section 7.6** and **Table 7.II-1**. New development and significant redevelopment projects are required to develop and implement a Project WQMP that includes BMPs. Depending upon the project size and characteristics, these may include:

- Consideration of Site Design BMPs
- Incorporation of all applicable Source Control BMPs
- Incorporation of project-based Treatment Control BMPs; and/ or participation in an approved regional or watershed management program as defined in Section 7-II.3.3.3 of this document in the affected watershed.

Descriptions and examples of the above BMP types are provided later within this document.

This model provides requirements for two types of new development and significant redevelopment projects:

- Priority Projects (Section 7.II - 3.0)
- Non-Priority Projects (Section 7.II - 4.0)

A project is a priority project if it meets any of the following criteria:

Table 7.II-1
Priority Projects Categories

1.	Residential development of 10 units or more
2.	Commercial and industrial development greater than 100,000 square feet including parking area
3.	Automotive repair shops (SIC codes 5013, 5014, 5541, 7532-7534, and 7536-7539)
4.	Restaurants where the land area of development is 5,000 square feet or more including parking area (SIC code 5812)
5.	*For San Diego Region* - Hillside development greater than 5,000 square feet *For Santa Ana Region* - Hillside development on 10,000 square feet or more, which are located on areas with known erosive soil conditions or where natural slope is twenty-five percent or more
6.	Impervious surface of 2,500 square feet or more located within, directly adjacent to (within 200 feet), or discharging directly to receiving waters within Environmentally Sensitive Areas
7.	Parking Lots 5,000 square feet or more, or with 15 parking spaces or more, and potentially exposed to urban stormwater runoff
8.	*For San Diego Region* - Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater

Definitions of the above terms and conditions are located in **Attachment E.**

All priority new development and significant redevelopment projects are required to:

- Incorporate and implement all Source Control BMPs (routine structural and routine non-structural) unless not applicable to the project due to project characteristics, and document clearly why any applicable Source Control BMP was not included.

- Consider and implement Site Design BMPs where applicable and feasible, and document those BMPs included; and

- Either implement Treatment Control BMPs, including a selection of such BMPs into the project design; or participate in or contribute to an acceptable regional or watershed management program as defined in Section 7-II.3.3.3 of this document. Projects participating in a regional or watershed management program will also implement Source Control BMPs and Site Design BMPs consistent with the approved program.

- The combination of Source Control, Site Design, and Treatment Control BMPs or regional or watershed programs must adequately address all identified pollutants of concern.

All Non-Priority Projects are required to:

- Implement all Source Control BMPs (routine structural and routine non-structural) unless not applicable to the project due to project characteristics and document clearly why any applicable Source Control BMP was not included; and

- Consider and implement all Site Design BMPs where applicable and feasible.

In the instance where only a project feature falls into a priority project category, such as a 6,000 sq. ft. parking lot for an industrial development that is less than 100,000 sq. ft., only the parking lot feature is subject to Model WQMP requirements.

The Project WQMP must be completed as follows:

- For projects not participating in a regional or watershed program the Project WQMP must be completed either prior to discretionary project approval or ministerial permit, (grading or building) issuance for discretionary projects, and prior to ministerial permit issuance for projects requiring only these types of permits.

- For projects participating in regional or watershed programs the regional or watershed program may be relied upon during the discretionary review process subject to a discussion of how the project will participate in the program, but a site specific Project WQMP must be completed prior to permit issuance.

Requirements of the Project WQMP shall be incorporated into project design and shown in the plans.

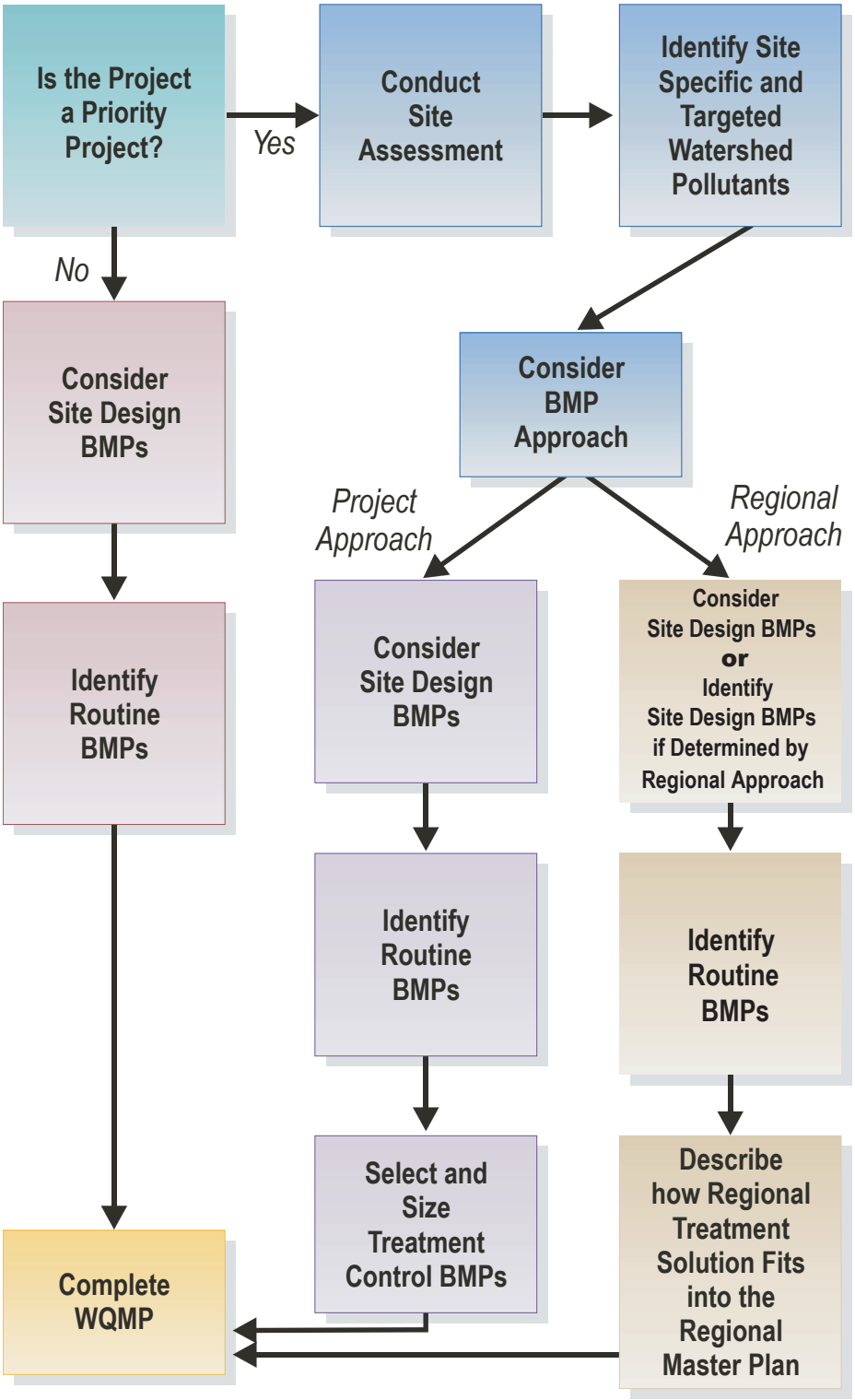
Departments carrying out public agency projects that are not required to obtain permits shall be responsible for ensuring Model WQMP requirements are incorporated into the project design and shown on the plans prior to bidding for construction contracts, or equivalent. Project WQMP requirements will be incorporated into the design of public agency projects and shown on the plans before allowing the project to commence.
Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered Priority Projects. Parking lots, buildings, and other structures associated with utility projects are subject to Model WQMP requirements if one or more of the criteria for the above categories are met.

7.II - 2.0 WQMP PREPARATION

Several steps are involved in completing an approvable Project WQMP for new development or significant redevelopment projects. **Figure 7.II-1** displays the implementation steps and decision steps that must be followed to successfully complete a Project WQMP.

Figure 7.II-1

Development Planning and WQMP Preparation Steps



7.II - 3.0 PRIORITY PROJECT WQMP PREPARATION

Priority new development or significant redevelopment projects perform the following steps for Project WQMP preparation:

- Site assessment (Section 7.II - 3.1)
- Identification of pollutants and hydrologic conditions of concern (Section 7.II - 3.2)
- Consideration of Site Design BMPs (Section 7.II - 3.3.1.)
- Incorporation of Source Control BMPs (Section 7.II - 3.3.2)
- Selection of regional or project–based approach to Treatment Control BMPs (Section 7.II - 3.3.3)
- Selection, sizing, and incorporation of Treatment Control BMPs (Section 7.II - 3.3.4)

7.II - 3.1 Site Assessment

Site assessment involves compiling the following:

- Planning Area/Community Name: Provide exhibit of subject and surrounding planning areas in sufficient detail to allow project location to be plotted on a base map of the Permittee
- Site specifics such as general and specific location, site address, and size (acreage to the nearest 1/10 acre)
- Watershed name
- Site characteristics, including description of site drainage and how it ties with drainage of surrounding property. Reference the Project WQMP's Plot Plan showing drainage flow arrows and how drainage ties to drainage of surrounding property

7.II - 3.2 Identification of Pollutants and Hydrologic Conditions of Concern

Priority project proponents shall use these guidelines to identify pollutants of concern from a development, potential pollutants of concern, and conditions of concern for which they need to mitigate or protect against. Once identified, appropriate control measures for these pollutants and conditions are specified in Section 7.II - 3.3.

Site design and source control measures are based on pollutants commonly associated with the proposed project land uses type (see **Table 7.II-2**). The combination of site design, source control and on-site treatment Control BMPs or regional and watershed programs are also required to address a project's expected or potential pollutants of concern.

7.II - 3.2.1 General Categories of Pollutants of Concern

Urban runoff and stormwater pollution from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens from the municipal storm drain system to tributary receiving waters. For the purpose of identifying pollutants of concern and associated stormwater BMPs, pollutants are grouped in nine general categories:

- ***Bacteria and Viruses*** – Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

- ***Metals*** – Primary source of metal pollution in stormwater are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

- ***Nutrients*** – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.

- ***Pesticides*** – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

- ***Organic Compounds*** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.

- ***Sediments*** – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

- ***Trash and Debris*** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. In addition, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

- ***Oxygen-Demanding Substances*** – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

- ***Oil and Grease*** – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

7.II - 3.2.2 Identify Pollutants from the Project Area

Using **Table 7.II-2**, identify pollutants that are anticipated to be generated, or have a potential to be generated from the proposed priority project land use categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern. Site-specific conditions must also be considered as additional pollutant sources, such as legacy pesticides or nutrients in site soils as a result of past agricultural practices.

7.II - 3.2.3 Identify Pollutants of Concern

To identify pollutants of concern in receiving waters, each priority project proponent shall, at a minimum, do the following:

1. , For each of the proposed project discharge points, identify the receiving water for each point of discharge and all water bodies downstream of the receiving water, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) prepared by the State Water Resources Control Board; the Water Quality Control Plan for the Santa Ana Basin prepared by the Santa Ana Regional Water Quality Control Board; or the Water Quality Control Plan for the San Diego Basin[1], prepared by the San Diego Regional Water Quality Control Board.

2. Identify each receiving water identified above that is listed on the most recent list of Clean Water Act Section 303(d) impaired water bodies (**Table 7.II-3**). List any and all pollutants for which the receiving waters are impaired. (**Table 7.II-3)** and identify each Clean Water Act Section 303 9d) impaired water body that is downstream of the receiving waters identified above. .

Compare the list of pollutants for which the receiving waters are impaired with the pollutants anticipated to be generated by the project (as discussed in Section 7.II.3.2.2).

Primary Pollutants of Concern - Any pollutants identified by **Table 7.II-2**, which have also been identified as causing impairment of receiving waters

Other Pollutants of Concern - Those pollutants identified using **Table 7.II-**2 which have not been identified as causing impairment of receiving waters.

Further information on pollutants of concern may also be available from the CEQA analysis of the project (e.g., project-specific pollutant evaluations in Environmental Impact Reports) and this site-specific information should be used to supplement, or in some cases supercede, the information in **Table 7.II-2**. Watershed planning documents should also be reviewed for identification of specific implementation requirements that address pollutants of concern.

Salinity, total dissolved solids (TDS), and chlorides are listed within the above-referenced

[1] http://www.swrcb.ca.gov/~rwqcb9/Programs/Planning_and_Services/SD_Basin/sd_basin.html

303(d) tables, but are not addressed in this Model WQMP, as they are not commonly of concern in typical development urban runoff and stormwater pollution.

Table 7.II-2
Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories and/or Project Features	General Pollutant Categories								
	Bacteria/Virus	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediments	Trash & Debris	Oxygen Demanding Substances	Oil & Grease
Detached Residential Development	X		X	X		X	X	X	X
Attached Residential Development	P		X	X		X	X	P (1)	P (2)
Commercial/ Industrial Development >100,000 ft^2	P (3)		P (1)	P (1)	P (2)	P (1)	X	P (1)	X
Automotive Repair Shops		X			X (4)		X		X
Restaurants	X						X	X	X
Hillside Development >5,000 ft^2 In SDRWQCB			X	X		X	X	X	X
Hillside Development >10,000 ft^2 In SARWQCB			X	X		X	X	X	X
Parking Lots		X	P (1)	P (1)		P (1)	X	P (1)	X
Streets, Highways & Freeways		X	P (1)	P (1)	X (4)	X	X	P (1)	X

X = anticipated.
P = potential
(1) A potential pollutant if landscaping or open area exist on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

Table 7.II-3
Summary of the 2002 303(d) Listed Water Bodies and Associated Pollutants of Concern for Orange County*

Region	Water Body	Watershed	Pollutant							
			Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/ Chlorides	Turbidity
Region 8 Santa Ana	Anaheim Bay	C		X		X				
	Bolsa Chica			X						
	Buck Gully Creek	H	X							
	Huntington Beach State Park	C	X							
	Huntington Harbour	D	X	X		X				
	Los Trancos Creek (Crystal Cove Creek)	H	X							
	Newport Bay, Lower	G		X		X				
	Newport Bay, Upper (Ecological Reserve)	G		X		X				
	Orange County Beaches	Varies						X		
	San Diego Creek, Reach 1	F	X			X				
	San Diego Creek, Reach 2	F		X			X			
	Seal Beach	A	X							
	Silverado Creek	E	X						X	
Region 9 San Diego	Aliso Creek (Mouth)	J	X							
	Aliso Creek (20 Miles)	J	X		X		X			
	Dana Point Harbor	K	X	X						
	Pacific Ocean Shoreline, Aliso Beach HSA	J	X							
	Pacific Ocean Shoreline, Dana Point HSA	K	X							
	Pacific Ocean Shoreline, Laguna Beach and San Joaquin Hills HSAs	I	X							
	Pacific Ocean Shoreline, Lower San Juan HSA	L	X							
	Pacific Ocean Shoreline, San Clemente, San Mateo, and San Onofre HSAs	M	X							
	Prima Deshecha Creek	M			X					X
	San Juan Creek (Lower one Mile)	L	X							
	San Juan Creek (Mouth)	L	X							
	Segunda Deshecha Creek	M			X					X

** Final Adoption by EPA pending*

7.II - 3.2.4 Identify Hydrologic Conditions of Concern

Common impacts to the hydrologic regime resulting from development typically include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity.

A change to a priority project site's hydrologic regime would be considered a condition of concern if the change would have a significant impact on downstream natural channels and habitat integrity. Because of these potential impacts, the following steps shall be followed by each priority project:

1. Determine if the downstream stream channel is fully natural or partially improved with a significant potential for erosive conditions or alteration of habitat integrity to occur as a result of upstream development. If either of these conditions exists, continue with the following steps.

2. Evaluate the project's conditions of concern in a drainage study report prepared by a registered civil engineer in the State of California, with experience in fluvial geomorphology and water resources management. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.

3. Review watershed plans, drainage area master plans or other planning documents to the extent available to identify if any specific implementation requirements for new development exist that address hydrologic conditions of conern.

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4. As part of the drainage study, the civil engineer shall conduct a field reconnaissance to observe and report on representative downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of an altered flow regime or change in sediment transport.

5. The drainage study shall compute rainfall runoff characteristics from the project area including, at a minimum, peak flow rate, flow velocity, runoff volume, time of concentration, and retention volume. These characteristics shall be developed for the two-year and 10-year frequency, Type I storm, of six-hour or 24-hour duration (whichever is the closer approximation of the site's time of concentration), during critical hydrologic conditions for soil and vegetative cover[2].

[2] Design storms can be found at http://www.wrcc.dri.edu/pcpnfreq.html. The Permittees may calculate the storm events using local rain data. In addition, isopluvial maps contained in the Orange County Hydrology Manual may be used to extrapolate rainfall data to

The drainage study shall report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish, with documentation deemed adequate by the permittee, that pre-project hydrologic conditions affecting downstream conditions of concern would be maintained by the proposed project, satisfactory to the Permittee, by incorporating the site design, source control, and treatment control requirements identified in **Section 3.3.4**. For conditions where a reduction in sediment transport from the project development and features would significantly impact downstream erosion, the Treatment Control BMPs proposed should be evaluated to determine if use of the BMPs would result in reducing beneficial sediment (i.e. sand and gravel) significantly below pre-development levels. Under such conditions alternative BMPs (such as watershed based approaches for erosional sediment control) may need to be considered.

7.II - 3.3 BMP Selection

All Priority Projects shall consider, incorporate and implement urban runoff and stormwater BMPs into the project design, in the following progression:

- Site Design BMPs
- Source Control BMPs (routine non-structural and routine structural)
- Treatment Control BMPs (or participation in a regional or watershed program)

At a minimum, Priority Projects must implement Source Control BMPs (routine non-structural and routine structural) and must implement Treatment Control BMPs (or participate in a regional or watershed program) unless a waiver is granted based on the infeasibility of all Treatment Control BMPs as discussed in Section 7.II – 6.0. BMPs must also achieve the performance standards set out in **Section 3.3.4**. Upon completion, for Public Agency projects will become subject to the Municipal Activities Program. Therefore it is not necessary to identify routine non-structural BMPs in the WQMP provided that such BMPs already been identified as part of the Municipal Activities Program (see **DAMP Section 5**).

A number of the Site Design and Treatment Control BMPs rely on infiltration of runoff to reduce the volume and load of pollutants to surface receiving waters. While such approaches can be very effective, there are potential limitations with respect to both soil stability and groundwater quality that are discussed in **Section 3.3.4** under *RESTRICTIONS ON USE OF INFILTRATION BMPs.*

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areas where insufficient data exists. If isopluvial maps are selected, Permittees shall describe their method for using isopluvial maps in their Local Implementation Plan.

7.II - 3.3.1 Site Design BMPs

Priority Projects shall be designed to minimize the introduction of pollutants that may result in significant impacts, generated from site runoff to the municipal storm drain system through a combination of BMPs that may include Site Design, Source Control, and Treatment Control BMPs. Priority Projects for which hydrologic conditions of concern have been identified shall also control post-development peak stormwater runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion rates and to protect stream habitat. Priority Projects can address these objectives by considering the incorporation of Site Design BMPs that are intended to create a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the municipal storm drain system, and minimizing clearing and grading.

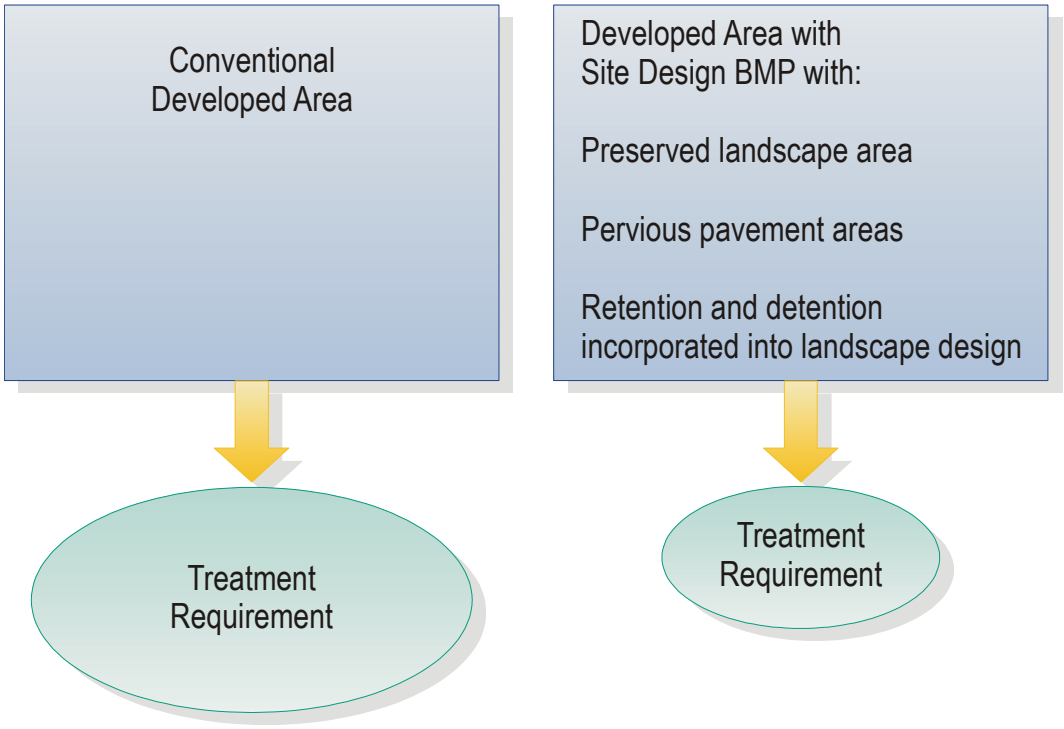
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.

- Implementing on-lot hydrologically functional landscape design and management practices.

Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Coefficient of Runoff, or "C Factor". The C Factor is a representation of the ability of a surface to produce runoff. Surfaces that produce higher volumes runoff are represented by higher C Factors. By incorporating more pervious, lower C Factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.

Detention and retention areas incorporated into landscape design provide areas for retaining and detaining stormwater flows, resulting in lower runoff rates and reductions in volume due to limited infiltration and evaporation. Such Site Design BMPs may reduce the size of Treatment Control BMPs,

Figure 7.II-2
Reduction of Treatment by Incorporation of Site Design BMPs



These design principles offer an innovative approach to urban stormwater management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates stormwater controls throughout the urban landscape. Useful resources for applying these principles, referenced in **Section 8.0 and Attachment B**, include Start at the Source (1999), and Low-Impact Development Design Strategies (1999).

DESIGN CONCEPT 1: MINIMIZE STORMWATER RUNOFF, MINIMIZE PROJECT'S IMPERVIOUS FOOTPRINT AND CONSERVE NATURAL AREAS

Minimize and/or control the post-development peak stormwater runoff discharge rates, velocities and volumes by utilizing measures that reduce runoff rates and volumes, and increase infiltration. A reduction in the stormwater runoff from a development project using properly designed BMPs, can yield a corresponding reduction in the amount of pollutants transported from the site. The undeveloped runoff volume should be determined by considering the project site to be in a natural condition with surface vegetation in place.

The following site design options shall be considered and incorporated where applicable and feasible, during the site planning and approval process consistent with applicable General Plan policies, other development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program.

1. Minimize impervious footprint. This can be achieved in various ways, including, but not limited to increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions

2. Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. Where available, permittees should also refer to their Multiple Species Conservation Plans or other biological regulations, as appropriate to assist in determining sensitive portions of the site.

   Within each of the previous categories, areas containing hillsides (as defined in this Model WQMP) should be considered more sensitive than the same category without hillsides.

3. Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials

4. Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised [3]. Incorporate landscaped buffer areas between sidewalks and streets
5. Reduce widths of street where off-street parking is available [4]

6. Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs

7. Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design

8. Use natural drainage systems if feasible.

9. Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration [5]

10. Construct onsite ponding areas or retention facilities to increase opportunities for infiltration

11. Other site design options that are comparable, and equally effective

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3 Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

4 However, street widths must still comply with life safety requirements for fire and emergency vehicle access.

5 However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

DESIGN CONCEPT 2: MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS (DCIAs)

Priority Projects shall consider and incorporate the following design characteristics, where determined applicable and feasible and with any Site Design BMPs included in an applicable regional or watershed program.

1. Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain

2. Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping

3. Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales

4. Use one or more of the following (for further guidance, see Start at the Source [1999]):

    a. Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings

    b. Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter

    c. Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems

    d. Other design concepts that are comparable and equally effective

5. Use one or more of the following features for design of driveways and private residential parking areas:

    a. Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system

    b. Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the municipal storm drain system

    c. Other design concepts that are comparable and equally effective

6. Use one or more of the following design concepts for the design of parking areas:

    a. Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design

b. Overflow parking (parking stalls provided in excess of the Permittee's minimum parking requirements) may be constructed with permeable paving

c. Other design concepts that are comparable and equally effective

7. Other design characteristics that are comparable and equally effective

7.II - 3.3.2 Source Control BMPs

The following Source Control BMPs (routine non-structural BMPs, routine structural BMPs and BMPs for individual categories/project features) are required within all new development and significant redevelopment projects regardless of their priority, including an applicable regional or watershed program, unless they do not apply due to the project characteristics. If any of the following Source Control BMP that would otherwise apply to the project is not included in the project, an explanation of why must be included in the Project WQMP or the regional or watershed program.

INCLUDE ROUTINE NON-STRUCTURAL SOURCE CONTROL BMPs:

- *N1 Education for Property Owners, Tenants and Occupants*

  For developments with no Property Owners Association (POA) or with POAs of less than fifty (50) dwelling units, practical information materials will be provided to the first residents/occupants/tenants on general housekeeping practices that contribute to the protection of stormwater quality. These materials will be initially developed and provided to first residents/occupants/tenants by the developer. Thereafter such materials will be available through the Permittees' education program. Different materials for residential, office commercial, retail commercial, vehicle-related commercial and industrial uses will be involved.

  For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA provide environmental awareness education materials, made available by the municipalities, to all member periodically. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains.

- *N2 Activity Restrictions*

  If a POA is formed, conditions, covenants and restrictions (CCRs) shall be prepared by the developer for the purpose of surface water quality protection. An example would be not allowing car washing outside of established community car wash areas in multi-unit complexes. Alternatively, use restrictions may be developed by a building operator through lease terms, etc. These restrictions must be included in the Project WQMP.

- *N3 Common Area Landscape Management*

  On-going maintenance consistent with County Water Conservation Resolution or city equivalent, plus fertilizer and/or pesticide usage consistent with Management Guidelines for Use of Fertilizers (**DAMP Section 5.5**). Statements regarding the specific applicable guidelines must be included in the Project WQMP.

- *N4 BMP Maintenance*

  Identify responsibility for implementation of each non-structural BMP and scheduled cleaning and/or maintenance of all structural BMP facilities.

- *N5 Title 22 CCR Compliance*

  Compliance with Title 22 of the California Code of Regulations and relevant sections of the California Health & Safety Code regarding hazardous waste management shall be enforced by County Environmental Health on behalf of the State. The Project WQMP must describe how the development will comply with the applicable section(s) of Title 22.

- *N6 Local Water Quality Permit Compliance*

  The Permittees, under the Water Quality Ordinance, may issue permits to ensure clean stormwater discharges from fuel dispensing areas and other areas of concern to public properties.

- *N7 Spill Contingency Plan*

  Prepared by building operator for use by specified types of building or suite occupancies and which mandates stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.

- *N8 Underground Storage Tank Compliance*

  Compliance with State regulations dealing with underground storage tanks, enforced by County Environmental Health on behalf of State.

- *N9 Hazardous Materials Disclosure Compliance*

  Compliance with Permittee ordinances typically enforced by respective fire protection agency for the management of hazardous materials. The Orange County, health care agencies, and/or other appropriate agencies (i.e. Department of Toxics Substances Control or Agricultural Department) are typically responsible for enforcing hazardous waste handling and disposal regulations.

N10 Uniform Fire Code Implementation

Compliance with Article 80 of the Uniform Fire Code enforced by fire protection agency.

- *N11 Common Area Litter Control*

For industrial/commercial developments and for developments with POAs, the owner/POA shall be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water. The owner/POA may contract with their landscape maintenance firms to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations by tenants/homeowners or businesses and reporting the violations to the owner/POA for investigation.

- *N12 Employee Training*

Education program (see N1) as it would apply to future employees of individual businesses. Developer either prepares manual(s) for initial purchasers of business site or for development that is constructed for an unspecified use makes commitment on behalf of POA or future business owner to prepare.

- *N13 Housekeeping of Loading Docks*

Loading docks typically found at large retail and warehouse-type commercial and industrial facilities shall be kept in a clean and orderly condition through a regular program of sweeping and litter control and immediate cleanup of spills and broken containers. Cleanup procedures should minimize or eliminate the use of water. If washdown water is used, it must be at disposed of in an approved manner and not discharged to the storm drain system. If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only if allowed by the local sewering agency through a permitted connection.

- *N14 Common Area Catch Basin Inspection*

For industrial/commercial developments and for developments with privately maintained drainage systems, the owner is required to have at least 80 percent of drainage facilities inspected, cleaned and maintained on an annual basis with 100 percent of the facilities included in a two-year period [cleaned] prior to the storm season, no later than October 15th each year. Drainage facilities include catch basins (storm drain inlets) detention basins, retention basins, sediment basins, open drainage channels and lift stations.

- *N15 Street Sweeping Private Streets and Parking Lots*

Streets and parking lots are required to be swept prior to the storm season, no later than October 15 each year.

- *N16 Commercial Vehicle Washing*

  This BMP Has Been Removed.

- *N17 Retail Gasoline Outlets*

  Retail gasoline outlets (RGOs) are required to follow operations and maintenance best management practices shown in the California Stormwater Quality Association (CASQA, formerly California Stormwater Quality Task Force) Best Management Practice Guide for Retail Gasoline Outlets. This document may be obtained by downloading from the CASQA website at http://www.stormwatertaskforce.org/swqtf/RGOGuide.htm or from forthcoming CASQA website.

INCLUDE ROUTINE STRUCTURAL SOURCE CONTROL BMPs

Provide Storm Drain System Stenciling and Signage

Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the municipal storm drain system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Stencils and signs alert the public to the destination of pollutants discharged into stormwater. The following requirements shall be included in the project design and shown on the project plans:

1. Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING-DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

2. Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

3. Maintain legibility of stencils and signs.

Design Outdoor Hazardous Material Storage Areas To Reduce Pollutant Introduction

Improper storage of materials outdoors may increase the potential for toxic compounds, oil and grease, fuels, solvents, coolants, wastes, heavy metals, nutrients, suspended solids, and other pollutants to enter the municipal storm drain system. Where the plan of development includes outdoor areas for storage of hazardous materials that may contribute pollutants to the municipal storm drain system, the following stormwater BMPs are required:

1. Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the municipal storm drain system; or (2)

protected by secondary containment structures (not double wall containers) such as berms, dikes, or curbs.

2. The storage area shall be paved and sufficiently impervious to contain leaks and spills.

3. The storage area shall have a roof or awning to minimize direct precipitation and collection of stormwater within the secondary containment area.

4. Any stormwater retained within the containment structure must not be discharged to the street or storm drain system.

Location(s) of installations of where these preventative measures will be employed must be included on the map or plans identifying BMPs.

Design Trash Storage Areas To Reduce Pollutant Introduction

All trash container areas shall meet the following requirements (limited exclusion: detached residential homes):

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash; and

2. Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.

3. Connection of trash area drains to the municipal storm drain system is prohibited.

Use Efficient Irrigation Systems and Landscape Design

Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system. (Limited exclusion: detached residential homes.) The following methods to reduce excessive irrigation runoff shall be considered, and incorporated on common areas of development and other areas where determined applicable and feasible by the Permittee:

1. Employing rain shutoff devices to prevent irrigation after precipitation.

2. Designing irrigation systems to each landscape area's specific water requirements.

3. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

4. Implementing landscape plan consistent with County Water Conservation Resolution or city equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

5. The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system.

6. Employing other comparable, equally effective, methods to reduce irrigation water runoff.

7. Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider other design features, such as:

   - Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff.

   - Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect.

   - Leave a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible.

   - Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.

Protect Slopes and Channels

Project plans shall include Source Control BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the Regional Boards and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

1. Convey runoff safely from the tops of slopes.

2. Avoid disturbing steep or unstable slopes.

3. Avoid disturbing natural channels.

4. Stabilize disturbed slopes as quickly as possible.

5. Vegetate slopes with native or drought tolerant vegetation.

6. Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.

7. Stabilize channel crossings as quickly as possible, and ensure that increases in runoff velocity and frequency caused by the project do not erode the channel.

8. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.

9. Onsite conveyance channels should be lined, where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are large enough to erode grass or other vegetative linings, riprap, concrete soil cement or geo-grid stabilization may be substituted or used in combination with grass or other vegetation stabilization.

10. Other design principles that are comparable and equally effective.

INCORPORATE REQUIREMENTS APPLICABLE TO INDIVIDUAL PROJECT FEATURES:

All projects, regardless of priority, shall adhere to each of the individual project category requirements that apply to the project (e.g., a restaurant would be required to incorporate the requirements for Equipment Wash Areas into the project design). Where identified in **Table 7.II-4**, the following requirements shall be incorporated into applicable priority projects.

Table 7.II-4
Source Control and Site Design Stormwater BMP Selection Matrix

Priority Project Category	Source Control BMPs (1)	Requirements Applicable to Individual Project Features (or Priority Project Categories) (2)							Site Design BMPs (3)
		Loading Dock Areas	Maintenance Bays	Vehicle Wash Areas	Outdoor Processing Areas	Equipment Wash Areas	Fueling Areas	Hillside Landscaping	
Detached Residential Development	R							R	C
Attached Residential Development	R			R				R	C
Commercial/ Industrial Development >100,000 ft^2	R	R	R	R	R	R	R	R	C
Automotive Repair Shop	R	R	R	R		R	R		C
Restaurants	R	R				R		R	C
Hillside Development >5,000 ft^2 in SDRWQCB	R							R	C
Hillside Development >10,000 ft^2 in SARWQCB	R							R	C
Parking Lots	R							R	C
Streets, Highways & Freeways	R							R	C

R = Required; select BMPs as required from the applicable steps in Section 7.II-3.3.2 or equivalent.
C = Consider and select one or more applicable BMPs
(1) Required for all projects regardless of priority. Refer to Section 7.II-3.3.2.
(2) Priority project categories must apply specific stormwater BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
(3) Refer to Section 7.II-3.3.1.

Loading Dock Areas

Loading/unloading dock areas shall include the following:

1. Cover loading dock areas, or design drainage to preclude urban run-on and runoff.

2. Direct connections to the municipal storm drain system from below grade loading docks (truck wells) or similar structures are prohibited. Stromwater can be discharged through a permitted connection to the storm drain system with a Treatment Control BMP applicable to the use.

3 Other features which are comparable and equally effective, that prevent unpermitted discharges to the municipal storm drain system.

4. Housekeeping of loading docks shall be consistent with N13.

Maintenance Bays

Maintenance bays shall include the following:

1. Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.

2. Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters from entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the municipal storm drain system is prohibited. If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection.

3. Other features which are comparable and equally effective, that prevent discharges to the municipal storm drain system without appropriate permits.

Vehicle Wash Areas

Projects that include areas for washing/steam cleaning of vehicles shall use the following:

1. Self-contained or covered with a roof or overhang.

2. Equipped with a wash racks constructed in accordance with the guidelines in **Attachment C**, and with the prior approval of the sewering agency (Note: Discharge monitoring may be required by the sewering agency).

3. Equipped with a clarifier or other pretreatment facility.

4. If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection.

5. Other features which are comparable and equally effective that prevent unpermitted discharges, to the municipal storm drain system.

Outdoor Processing Areas

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste handling, treatment, and disposal, and other operations determined to be a potential threat to water quality by the Permittee shall adhere to the following requirements.

1. Cover or enclose areas that would be the sources of pollutants; or, slope the area toward a sump that will provide infiltration or evaporation with no discharge; or, if there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection

2. Grade or berm area to prevent run-on from surrounding areas.

3. Installation of storm drains in areas of equipment repair is prohibited.

4. Other features which are comparable or equally effective, that prevent unpermitted discharges to the municipal storm drain system.

5. Where wet material processing occurs (e.g. Electroplating), secondary containment structures (not double wall containers) shall be provided to hold spills resulting from accidents, leaking tanks or equipment, or any other unplanned releases (Note: If these are plumbed to the sanitary sewer, the structures and plumbing shall be in accordance with **Section 7.II - 8, Attachment D,** and with the prior approval of the sewering agency). See also **Section 7.II - 3.4.2, N10**. Design of secondary containment structures shall be consistent with "Design of Outdoor Material Storage Areas To Reduce Pollutant Introduction".

Some of these land uses (e.g. landfills, waste piles, wastewater and solid waste handling, treatment and disposal) may be subject to other permits including Phase I Industrial Permits that may require additional BMPs.

Equipment Wash Areas

Outdoor equipment/accessory washing and steam cleaning activities shall use the following:

1. Be self-contained or covered with a roof or overhang.

2. Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate and discharge If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection to a sanitary sewer, through an approved connection.

3. Other features which are comparable or equally effective that prevent unpermitted discharges to the municipal storm drain system.

Fueling Areas

Fuel dispensing areas shall contain the following:

1. At a minimum, the fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. The fuel dispensing area shall be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.

3. The fuel dispensing area shall have an appropriate slope (2% - 4%) to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater.

4. An overhanging roof structure or canopy shall be provided. The cover's minimum dimensions must be equal to or greater than the area of the fuel dispensing area in #1 above. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's Treatment Control BMP(s) prior to discharging to the municipal storm drain system.

Hillside Landscaping

Hillside areas that are disturbed by project development shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control, satisfactory to the Permittee.

Wash Water Controls For Food Preparation Areas

Food establishments (per State Health & Safety Code 27520) shall have either contained areas, sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas, sinks shall also be structurally covered to prevent entry of stormwater. Adequate signs shall be provided and appropriately placed stating the prohibition of discharging of washwater to the storm drain system.

Community Car Wash Racks

In complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for common usage.

Wash waters from this area may be directed to the sanitary sewer (in accordance with **Attachment C,** and with the prior approval of the sewering agency); to an engineered infiltration system; or to an equally effective alternative. Pre-treatment may also be required. Signage shall be provided prohibiting discharges of washwater outside of the designated area.

7.II - 3.3.3 Selection of Regional or Project–Based Approach to Treatment Control BMPs

Regional and/or watershed management programs that address runoff from New Development/Significant Redevelopment are encouraged to be considered as alternatives to Project WQMPs within the Santa Ana Regional Board permit area. Under certain conditions within the San Diego Regional Board permit area, offsite controls can also be considered. It is anticipated that individual or groups of Permittees will approve regional or watershed programs that will be utilized within their respective jurisdictions. Regional or watershed programs are meant to provide comprehensive water quality solutions for the new development or significant projects they are meant to serve. To this end, all BMPs applicable to individual projects served by the approved regional or watershed program as well as details of applicable Site Design BMPs and offsite (as well as any on-site) Treatment Control BMPs will be predetermined in the approved regional or watershed program

A project may be approved based upon reliance on a Regional or Watershed Program approach if the following criteria are met:

- The project incorporates all appropriate routine Source Control BMPs and any applicable Site Design BMPs.

- The regional program incorporates Treatment Control BMPs that are sized to treat at a minimum the volume or flow for the water quality design storm for the runoff from the project and other new development or significant redevelopment projects served by the regional or watershed BMP(s) as determined by the planning for the regional/watershed program. The water quality design storm runoff volume or flow obligation for project participation in the regional/watershed program may be reduced based on the incorporation of any Site Design BMPs that offset treatment requirements for pollutants of concern.

- An implementation plan is identified including funding, timing, ability to implement and responsible parties. The implementation plan can rely on an adopted Regional/Watershed Master Plan. If a project is in a watershed where a Regional/Watershed Program can be considered or has already been adopted, the Project WQMP will describe or reference the Regional/Watershed Program and describe how the project will participate in or contribute to the program. The implementation plan will also identify an appropriate level of either project-specific monitoring or coordination with regional monitoring programs.

- One or more Permittees may have conducted and adopted a master plan to determine where on-site and community-wide facilities are appropriate. Where it is determined by the Permittees that on-site facilities are necessary, each Permittee would either define the performance standards to be consistent with or more stringent than this Model WQMP. When regional /watershed treatment controls are determined to be most practical, the developer may need to construct these facilities (for larger development projects), or pay a share of these facilities' cost through an equitable fee-in-lieu-of method. It is therefore important to establish an overall performance standard to allow the developer to select the appropriate Treatment Control BMPs given site conditions, costs, and performance.

When deciding to implement a regional or watershed management program, specific performance criteria should be evaluated. These performance criteria are listed as follows:

- The degree of pollution control provided under typical operating conditions.
- Variability of efficiency from pollutant to pollutant
- Variability of efficiency with storm characteristics
- The effect of design variables on performance
- Stability of efficiency over time
- Effectiveness relative to other BMPs
- Reduction of toxicity
- Improvement in, or protection of, downstream biotic communities
- Potential downstream negative impacts

Several factors affect whether a regional/watershed or project-based (on-site) structural approach is more feasible. Among these are removal effectiveness, cost, maintenance and construction timing:

Pollutant Removal Effectiveness

A variety of pollutant removal methods have been utilized in BMP monitoring studies to evaluate efficiency. The following are six methods typically used by investigators:

- Efficiency ratio
- Summation of loads
- Regression of loads
- Mean concentration
- Efficiency of individual storm loads
- Reference watersheds and before/after studies

Equations and example calculations are provided in the ASCE/EPA Technical Memorandum titled "Development of Performance Measures", which can be found in **Attachment D** of this Exhibit.

Cost

As with the selection of all BMPs, cost effectiveness is an important criterion to consider. When evaluating regional/watershed programs, it must be determined who will be responsible for funding the construction and/or upkeep of the regional/watershed control measures.

It is often most cost effective to utilize an existing treatment control near the development site. For instance, many Treatment Control BMPs can be incorporated into regional flood control detention/retention facilities with modest design refinements, and limited increased land requirements and cost. However, this type of alternative should be reviewed by the Orange County Flood Control District to check that both flood control and pollution control objectives are met.

Other potential issues that may affect cost include filling, dredging, and streambed alteration conditions; in which case, the project should be reviewed by the Army Corps of Engineers, the Regional Board, and the Department of Fish and Game.

Maintenance

Proper maintenance is crucial for all BMPs. It is necessary to clearly state who will be responsible for the maintenance and upkeep of the regional/watershed Treatment Control BMPs, as the responsible party in a regional/watershed program is not as apparent as with an on-site treatment control.

Construction Timing

Participation in a regional or watershed program may be approved provided construction of the regional/watershed structural Treatment Control BMP is completed (or an equivalent temporary alternative is put in place) prior to the post-construction use of the regional/watershed BMP by the new development or significant redevelopment project being approved. The regional/watershed BMPs shall only be required to have capacity to treat the dependent developments or phases of development that are in use.

Interim stormwater BMPs that provide equivalent or greater treatment than is required by the Model WQMP may be implemented until each regional/watershed Treatment Control BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

7.II - 3.3.4 Treatment Control BMPs

Minimizing a development's detrimental effects on water quality can be most effectively achieved using a combination of Site Design, Source Control and Treatment Control BMPs. Where projects have been designed to reduce, the introduction of anticipated pollutants of concern that may result in significant impacts to the receiving waters through the implementation of Site Design and Source Control stormwater BMPs, the development may still have the potential for pollutants of concern to enter the municipal storm drain system or receiving waters.

Where acceptable regional or watershed management programs are available within the downstream watershed to address the pollutants of concern from new development and significant redevelopment, a project may participate in a regional or watershed program provided the program meets the criteria discussed in **Section 7.II - 3.3.3**. Otherwise, Priority Projects shall be designed to remove pollutants of concern from the municipal storm drain system through the incorporation and implementation of Treatment Control BMPs.

In meeting the requirements in this section, Priority Projects shall implement a single or combination of stormwater treatment BMPs that will remove anticipated pollutants of concern, as identified by the procedure in **Section 7.II - 3.2**, in site runoff. Treatment Control BMPs must be implemented unless a waiver is granted to the project by the Permittee, based on the infeasibility of any Treatment Control BMP (see **Section 7.II – 6.0**).

QUANTITY DESIGN STANDARD FOR TREATMENT CONTROL BMPs

All Priority Projects shall design, construct and implement structural Treatment Control BMPs that meet the design standards of this section, unless specifically exempted by the limited exclusions listed at the end of this section or the project is participating in an acceptable regional or watershed management program. Structural Treatment Control BMPs required by this section shall be operational prior to the use of any dependent development, and shall be located and designed in accordance with the requirements here in this section.

Unlike flood control measures that are designed to handle peak flows, stormwater Treatment Control BMPs are designed to treat the more frequent, lower-flow storm events, or the first flush portions of runoff from larger storm events (typically referred to as the first-flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. The flow and volume from such small events is targeted for treatment. There is marginal water quality benefit gained by sizing treatment facilities to handle flows or volumes greater than the ones generated by small events.

The primary control strategy for designing Treatment Control BMPs is to treat the Stormwater Quality Design Flow (SQDF) or the Stormwater Quality Design Volume (SQDV) of the stormwater runoff. **Table 7.II-5** lists BMPs along with the basis of design, SQDF or SQDV, to be used for designing the BMP. **Attachment A** to this Exhibit provides detailed guidance and tools for determining the SQDV and SQDF for a project.

Table 7.II-5 Basis of Design for Treatment Control BMPs

Treatment Control BMP	Design Basis
Vegetated (Grass) Strips	SQDF
Vegetated (Grass) Swales	
Proprietary Control Measures	
Dry Detention Basin	SQDV
Wet Detention Basin	
Constructed Wetland	
Detention Basin/Sand Filter	
Porous Pavement Detention	
Porous Landscape Detention	
Infiltration Basin	
Infiltration Trench	
Media Filter	
Proprietary Control Measures	

Stormwater Quality Design Volume (SQDV)

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

1. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record;

2. The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998); or

3. The volume of annual runoff based on unit basin storage volume, to achieve 90 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/ Commercial, (1993), or

4. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event,[6]

OR

Stormwater Quality Design Flow (SQDF)

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

1. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour for each hour of a storm event; or

2. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or

3. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

Limited Exclusions:

1. Proposed restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the Treatment Control BMP and numerical sizing criteria requirements.

2. Where significant redevelopment results in an increase of less than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Project WQMP requirements, the Treatment Control BMP and numeric sizing criteria discussed in this section apply only to the addition, and not to the entire development.

SELECTION OF TREATMENT CONTROL BMPs

1. To select a structural Treatment Control BMP, each Priority Project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in **Table 7.II-2**).

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[6] This volume is not a single volume to be applied to all of Orange County. The size of the 85th percentile storm event is different for various parts of the County. The Permittees may calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.8 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Permittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Permittees shall describe their method for using isopluvial maps in their Local Implementation Plan prepared as Appendix A of the 2003 DAMP.

Any pollutants identified by **Table 7.II-2**, which are also causing a Clean Water Act section 303(d) impairment of receiving waters of the project, shall be considered primary pollutants of concern. Priority Projects shall select a single or combination of stormwater Treatment Control BMPs, which address the particular primary pollutant(s) of concern. The Treatment Control BMP Selection Matrix (**Table 7.II-6)** should be used as a guide to assist in the selection of BMPs. BMPs are indicated in **Table A.II-6** that are presumed to be adequate to address their specific pollutant(s) of concern, as these BMPs have been shown to have either medium or high effectiveness in removing these particular pollutants. The selected Treatment Control BMP(s) will address other pollutants in addition to the primary pollutant(s) as shown in **Table A.II-6**.

If during the CEQA process a more refined evaluation of the project identifies that impacts on receiving waters may not be significant and that the project will not cause further exceedance of water quality objectives related to the pollutant(s) for which the receiving water is impaired, the project shall not be required to use pollutants-specific treatment BMP(s) but may use any Treatment Control BMP or combination of stormwater Treatment Control BMPs that are designed to mitigate pollution.

2. Priority Projects that are not anticipated to generate a primary pollutant of concern, shall select a single or combination of stormwater Treatment Control BMPs from **Table 7.II-6**, that are designed to be effective in reducing pollutants of concern.

3. Alternative stormwater Treatment Control BMPs not identified in **Table 7.II-6** may be approved at the discretion of the Permittee, provided the alternative Treatment Control BMP is as effective in removal of pollutants of concern as other feasible BMPs listed in **Table 7.II-6**.

LOCATE TREATMENT CONTROL BMPs NEAR POLLUTANT SOURCES

Project-based (on-site) structural Treatment Control BMPs should be implemented close to pollutant sources to minimize costs and maximize pollutant removal prior to runoff entering receiving waters. Such Treatment Control BMPs may be located on- or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following requirements:

1. All structural Treatment Control BMPs shall be located so as to infiltrate, filter, and/or treat the required runoff volume or flow prior to its discharge to any receiving water.

2. Multiple post-construction structural Treatment Control BMPs for a single Priority Project shall collectively be designed to comply with the design standards of this section;

Table 7-II-6
Treatment Control BMP Selection Matrix [1]

Pollutant of Concern	Treatment Control BMP Categories					
	Biofilters	**Detention Basins**	**Infiltration Basins** [2]	**Wet Ponds or Wetlands**	**Filtration**	**Hydrodynamic Separator Systems** [3]
Sediment Turbidity	H/M	H/M	H/M	H/M	H/M	H/M
Nutrients	L	H/M	H/M	H/M	H/M	L
Organic Compounds	U	U	U	U	H/M	L
Trash & Debris	L	H/M	U	U	H/M	H/M
Oxygen Demanding Substances	L	H/M	H/M	H/M	H/M	L
Bacteria & Viruses	U	U	H/M	U	H/M	L
Oil & Grease	H/M	H/M	U	U	H/M	L/M
Pesticides (non-soil bound)	U	U	U	U	U	L

(1) Cooperative periodic performance assessment may be necessary. This Treatment Control BMP table will be updated as needed and as knowledge of stormwater treatment BMPs improves.

(2) Including trenches and porous pavement.

(3) Also known as hydrodynamic devices and baffle boxes.

L: Low removal efficiency

H/M: High or medium removal efficiency

U: Unknown removal efficiency

Sources: Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993), National Stormwater Best Management Practices Database (2001), and Guide for BMP Selection in Urban Developed Areas (2001).

Biofilters include:

- Grass swales
- Grass strips
- Wetland vegetation swales
- Bioretention

Detention Basins include:

- Extended/dry detention basins with grass lining
- Extended/dry detention basins with impervious lining

Infiltration Basins include:

- Infiltration basins
- Infiltration trenches

Wet Ponds and Wetlands include:

- Wet ponds (permanent pool)
- Constructed wetlands

Filtration Systems include:

- Media filtration
- Sand filtration

Hydrodynamic Separation Systems include:

- Swirl Concentrators
- Cyclone Separators

3. Shared stormwater Treatment Control BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;

4. Interim stormwater Treatment Control BMPs that provide equivalent or greater treatment than is required by this section may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

For projects participating in a regional or watershed program in lieu of project-based BMPs, the BMPs must be located in accordance with the approved regional or watershed BMP program.

RESTRICTIONS ON USE OF INFILTRATION BMPS

Grading permits may limit or prohibit the use of infiltration BMPs in hillside or other special situations where slope stability and subsurface stability are of concern. Over time, infiltration may affect pre or post-development subsurface conditions, creating potential for instability.

It is also important to note that any drainage feature that infiltrates runoff poses some risk of potential groundwater contamination. Three factors significantly influence the potential for urban runoff to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in urban runoff, (iii) and soluble fraction of pollutant. The risks associated with groundwater infiltration can be managed by:

- Designing landscape drainage features so that they promote infiltration of runoff, but do not inject runoff so that it bypasses the natural processes of filtering and transformation that occur in the soil. Taking reasonable steps to prevent the illegal discharge of wastes to drainage systems.

  In general, designs that disperse runoff over landscaped areas or through permeable surfaces are the most effective, easiest to maintain and have the lowest initial cost. These designs also minimize the risk of illegal disposal because the surface is visible and the infiltration rate per unit area is relatively low.

- For some sites, it may be feasible to use detention basins to infiltrate additional runoff in a more compact area, but the designer must consider the potential for illegal disposal of chemical spills. Detention basins should not drain to, or be located near, work areas where wash-water or liquid wastes are generated of where hazardous chemicals are stored. Detention basins should be clearly marked with "no dumping" signs and should be inspected regularly.

- The Orange County Groundwater Basin and the San Juan Groundwater Basin are the primary managed drinking water basins for the county residents and must be protected as a source of safe drinking water. The Orange County Water District (OCWD) and the San Juan Basin Authority (SJBA) are the agencies responsible for managing the Orange County Groundwater Basin and the San Juan Groundwater Basin. Planning and possible implementation of infiltration facilities must always be coordinated with OCWD and SJBA

to make sure that proposed solutions to stormwater quality do not cause groundwater quality problems.

- The risk of contamination of groundwater may be reduced by pretreatment of urban runoff. A discussion of limitations and guidance for infiltration practices is contained in Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report *No. EPA/600/R-94/051, USEPA (1994).*

To protect groundwater quality, each Permittee shall apply restrictions to the use of any Treatment Control BMPs that are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). As additional ground water basin data is obtained, Permittees, in coordination with OCWD and SJBA, may develop additional restrictions on the use of any BMPs that allow incidental infiltration.

At a minimum, use of structural Treatment Control BMPs that are designed to primarily function as infiltration devices shall meet the following conditions[7]:

1. Use of structural infiltration treatment BMPs shall not cause or contribute to an exceedance of groundwater water quality objectives.

2. Pollution prevention and Source Control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural Treatment Control BMPs are to be used.

3. Structural infiltration Treatment Control BMPs shall not cause a nuisance or pollution, as defined in Water Code Section 13050.

4. Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration.

5. All dry weather flows shall be diverted from infiltration devices except for those non-stormwater discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to municipal storm drain systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and dechlorinated swimming pool discharges.

6. The vertical distance from the base of any infiltration structural Treatment Control BMP to the seasonal high groundwater mark shall be at least 10 feet or as determined on an individual, site-specific basis by the Permittee. Where groundwater does not support

[7] These conditions do not apply to structural Treatment Control BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained. Reduction of vertical criterion should always be coordinated with OCWD and SJBA

7. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.

8. Infiltration structural Treatment Control BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet or RV storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Permittee in their Local Implementation Plan (see **Appendix A, 2003 DAMP**).

9. The horizontal distance between the base of any infiltration structural Treatment Control BMP and any water supply wells shall be 100 feet or as determined on an individual, site-specific basis by the Permittee.

10. Any entity that implements a structural infiltration Treatment Control BMP shall be required to mitigate any groundwater contamination caused by the infiltration system.

Where infiltration Treatment Control BMPs are authorized, their performance shall be evaluated for impacts on groundwater quality. In developing the local WQMPs, Permittees may develop additional restrictions on the use of Treatment Control BMPs that are designed to primarily function as infiltration devices. Permittees under the San Diego Regional Board shall consider Permit Section D.1.g. requirements to control the contribution of pollutants from one portion of the watershed to another portion of the watershed through interagency agreements among the Permittees. In those instances where a Permittee determined that implementation of proposed infiltration Treatment Control BMPs within their jurisdiction has a potential impact to groundwater quality in another jurisdiction, Permittees may include a notification requirement be placed upon those proposing such use in addition to the above protection measures.

7.II - 4.0 NON-PRIORITY PROJECTS

Non-Priority Projects for new development or significant redevelopment covered under this program shall perform the following steps for Project WQMP preparation using a process similar to described for Priority Projects:

- Incorporate all applicable Source Control BMPs (routine non-structural and routine structural, including requirements applicable to individual project features). See Section 7.II-3.3.2 for more details.

- Consider Site Design BMPs

  All non-priority new development and significant redevelopment projects shall consider, and incorporate and implement Site Design BMPs, where determined applicable and feasible during the site planning and approval process. See Section 7.II-3.3.1 for details.

7.II - 5.0 PROVIDE PROOF OF ONGOING STORMWATER BMP MAINTENANCE

The Permittees shall not accept stormwater structural BMPs as meeting the WQMP requirements standard, unless an O&M Plan is prepared (see **DAMP Section 7.6.6**) and a mechanism is in place that will ensure ongoing long-term maintenance of all structural and non-structural BMPs. This mechanism can be provided by the Permittee or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural and non-structural BMPs in project plans, and if the Permittee does not provide a mechanism for BMP maintenance, the Permittee shall require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the Permittee, including, but not limited to covenants, legal agreements, maintenance agreements, conditional use permits and/or funding arrangements.

7.II - 5.1 Maintenance Mechanisms

1. **Public entity maintenance**: The Permittee may approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for operation, maintenance, repair and replacement of the BMP. Unless otherwise acceptable to individual Permittees, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the Permittees may seek protection from liability by appropriate releases and indemnities.

   The Permittee shall have the authority to approve stormwater BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The Permittee shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The Permittee must be

identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

2. **Project proponent agreement to maintain stormwater BMPs**: The Permittee may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as necessary into perpetuity. Security or a funding mechanism with a "no sunset" clause may be required.

3. **Assessment districts**: The Permittee may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for stormwater BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.

4. **Lease provisions**: In those cases where the Permittee holds title to the land in question, and the land is being leased to another party for private or public use, the Permittee may assure stormwater BMP maintenance, repair and replacement through conditions in the lease.

5. **Conditional use permits**: For discretionary projects only, the Permittee may assure maintenance of stormwater BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.

6. **Alternative mechanisms**: The Permittee may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

7.II - 5.2 Permit Closeout Requirements

For discretionary projects, the Permittee-approved method of stormwater BMP maintenance shall be incorporated into the project's permit, and shall be consistent with permits issued by resource agencies, if any. Just as with all other aspects of a project's approved plans and designs, the Permittees will make a determination that all requirements of the Project WQMP have been satisfactorily completed prior to closeout of permits and issuance of certificates of use and occupancy (see **DAMP Section 7.6.6**).

For projects requiring only ministerial permits, the Permittee-approved method of stormwater BMP maintenance shall be shown on the project plans before the issuance of any ministerial permits. Verification will occur similar to discretionary projects.

In all instances, the project proponent shall provide proof of execution of a Permittee-approved method of maintenance, repair, and replacement (O&M Plan – See **Section 5.3**) before the issuance of construction approvals, permit closeout and issuance of certificates of use and occupancy. Permittees carrying out public projects that are not required to obtain permits shall be responsible for ensuring that a Permittee-approved method of stormwater BMP maintenance repair and replacement is executed prior to the completion of construction. For all properties, the verification mechanism will include the project proponent's signed statement, as part of the project application, accepting responsibility for all structural BMP maintenance, repair and replacement, until a Permittee-approved entity agrees to assume responsibility for structural

BMP maintenance, repair and replacement or an alternative mechanism is approved by the Permittee regarding maintenance, repair and replacement of the structural BMP.

7.II - 5.3 Maintenance Requirements

1. Operation & Maintenance (O&M) Plan: The Permittee shall ensure that a copy of an Operation & Maintenance (O&M) plan, prepared by the project proponent satisfactory to the Permittee, is received prior to permit closeout and the issuance of certificates of use and occupancy. The O&M Plan describes the designated responsible party to manage the stormwater BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the inspection and servicing of all structural BMPs on an annual basis.

   The project proponent or Permittee-approved maintenance entity shall complete and maintain O&M forms to document all maintenance requirements. Parties responsible for the O&M plan shall retain records for at least 5 years. These documents shall be made available to the Permittee for inspection upon request at any time.

2. Access Easement/Agreement: As part of the maintenance mechanism selected above, the Permittee shall require the inclusion of a copy of an executed access easement that shall be binding on the land throughout the life of the project, until such time that the stormwater BMP requiring access is replaced, satisfactory to the Permittee.

7.II - 6.0 WAIVER OF STRUCTURAL TREATMENT BMP REQUIREMENTS

Permittees may provide for a Priority Project to be waived from the requirement of implementing structural Treatment Control BMPs (see **Section 7.II - 3**) if infeasibility can be established. A Permittee shall only grant a waiver of infeasibility when all available structural treatment BMPs have been considered and rejected as infeasible. The burden of proof is on the project proponent to demonstrate that all available measures are infeasible. Permittees shall notify the Executive Officer of the appropriate Regional Board by Certified Mail (with Return Receipt) within five (5) days of each waiver issued and a copy of the waiver documentation shall include the name of the person granting each waiver and a copy of the Project WQMP.

Waivers may only be granted for structural Treatment Control BMP and structural Treatment Control BMP sizing requirements. Priority Projects, whether or not granted a waiver, may not cause or contribute to an exceedance of water quality objectives. Pollutants in runoff from projects granted a waiver must still be reduced through the use of Source Control and consideration of Site Design BMPs.

In considering a waiver the Permittees should review the CEQA documentation for the project to identify whether a significant unmitigatable impact was identified that was subject to a statement of overriding considerations.

Each Permittee that implements a waiver program may, at its option, also develop a WQMP waiver impact fee program to require project proponents who have received waivers to transfer the savings in cost, or a proportionate share thereof, as determined by the Permittee, to a stormwater mitigation fund. Each Permittee shall notify the Regional Board if a WQMP waiver impact fee program is developed pursuant to this Model WQMP. Further, details for any WQMP waiver impact fee program may be set out in the Local Implementation Plan (DAMP Appendix A), or in supplemental submissions if multiple Permittees establish a joint mitigation fund program for a region or watershed.

This Model WQMP does not preclude Permittees or groups of Permittees from imposing any other fees or charges on development projects that are permitted by law, or from managing or expending the monies received from such non-WQMP programs in any manner authorized by law.

7.II - 7.0 ALTERNATIVE APPROACHES FOR TREATMENT CONTROLS

7.II - 7.1 Site Design Stormwater Treatment Credits

Any Permittee may develop and submit for public review and Regional Board approval, a regional Model Site Design Stormwater Treatment Credits program that allows reductions in the volume or flow of stormwater that must be captured or treated on a project in return for the inclusion of specified project design features in the project. The Model Site Design Stormwater Treatment Credits program shall be deemed part of this Model WQMP following Regional Board approval.

Any such model program shall specify the conditions under which project proponents can be credited for the use of Site Design BMPs and low impact development techniques that can reduce the volume of stormwater runoff, preserve natural areas, and minimize the pollutant loads generated and potentially discharged from the site. Any Site Design Stormwater Treatment Credits program implemented by a Permittee within its jurisdiction shall be consistent and compliant with this model approved by the Regional Board.

7.II – 8.0 RESOURCES AND REFERENCES

A list of resources for information is provided in **Attachment B**.

ATTACHMENT A

DESIGN OF TREATMENT CONTROL BMPs USING THE STORMWATER QUALITY DESIGN FLOW (SQDF) OR THE STORMWATER QUALITY DESIGN VOLUME (SQDV)

Unlike flood control measures that are designed to handle peak flows, stormwater Treatment Control BMPs are designed to treat the more frequent, lower-flow storm events, or the first flush portions of runoff from larger storm events (typically referred to as the first-flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. The flow and volume from such small events is targeted for treatment.

The primary control strategy for designing Treatment Control BMPs is to treat the Stormwater Quality Design Flow (SQDF) or the Stormwater Quality Design Volume (SQDV) of the stormwater runoff. This section explains how to calculate the SQDF or the SQDV of the stormwater runoff. In addition, Treatment Control BMPs must be designed to safely convey or bypass peak design storms.

Hydrology/Hydraulics

Hydrologic calculations for determining peak design storm flows in Orange County shall be in accordance with the latest edition of the Orange County Hydrology Manual produced in January 1986, together with the procedure set forth herein. Where jurisdictions within Orange County have approved alternative hydrologic calculation methods, the alternative methods may be utilized if they have been approved by the jurisdiction for use in design of flow-based stormwater quality BMPs.

The Orange County Hydrology Manual requires that storm drains with tributary areas of less than 640 acres be designed for a minimum of 10-year frequency below the top of the curb elevation using a combination of street and storm drain flow. In sump conditions, catch basin and connecting storm drains must be designed to a 25-year frequency. Habitable structures shall have 100-year flood protection.

Stormwater Quality Design Flow (SQDF) Calculations

The Stormwater Quality Design Flow (SQDF) is defined as the maximum flow rate of runoff produced from a rainfall intensity of 0.2-inch of rainfall per hour[8].

Calculation Procedure

1. The Stormwater Quality Design Flow in Orange County is defined as $Q_{P, SQDF}$.

2. Calculate the peak rate stormwater quality design flow for the site (or each sub-drainage area that will discharge to a separate BMP) produced by 0.2-inch/hour rainfall by using the rational method equation:

$$Q_{P, SQDF} = C * I * A$$

Where:

C = runoff coefficient obtained from **Table A-1**.

I = rainfall intensity (0.2 in/hr)

A = area of the site or sub-drainage area in acres

Note: An alternate but less conservative method of computing the peak rate stormwater quality design flow ($Q_{P, SQDF}$) is to use the formula given in section D.6 of the Orange County Hydrology Manual, for I less than or equal than the lowest infiltration rate Fp for soil group D. This formula is:

$$Q_{P, SQDF} = 0.90 * a_i * I * A$$

Where:

a_i = ratio of impervious area to total area (decimal fraction)

[8] As defined in Section XII.B.3.B of the California Regional Water Quality Control Board, Santa Ana Region, Waste Discharge Requirements for the County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County within the Santa Ana Region, Urban Stormwater Runoff Management Program, Orange County, Order No. R8-2002-0010, NPDES Permit No. CAS618030; and in Section F.1.b.(2)(c) of the California Regional Water Quality Control Board, San Diego Region, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County and the Orange County Flood Control District within the San Diego Region, Board Order No. R9-2002-0001, NPDES CAS0108740

Table A-1

C Values Based on Impervious/Pervious Area Ratios

% Impervious	% Pervious	C
0	100	0.15
5	95	0.19
10	90	0.23
15	85	0.26
20	80	0.30
25	75	0.34
30	70	0.38
35	65	0.41
40	60	0.45
45	55	0.49
50	50	0.53
55	45	0.56
60	40	0.60
65	35	0.64
70	30	0.68
75	25	0.71
80	20	0.75
85	15	0.79
90	10	0.83
95	5	0.86
100	0	0.90

Example Stormwater Quality Design Flow (SQDF) Calculation

The steps below show an example calculation for a 30-acre site with runoff coefficient of 0.45 (40% impervious).

Step 1:

Design Flow = $Q_{P, SQDF} = C * I * A$

Step 2:

Calculate the peak rate of flow

$Q_{P, SQDF} = 0.45 \times 0.2 \times 30 = 2.7$ cfs = Stormwater Quality Design Flow for the BMP.

Stormwater Quality Design Storm Volume (SQDV) Calculations

Hydrologic calculations for design of volumetric-based stormwater quality BMPs in Orange County shall be in accordance with one of the four following approaches specified in the permits:

i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.8 inch approximate average for the Orange County area)[9]; or

ii. The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual and Report on Engineering Practice No. 87, (1998); or

iii. The volume of annual runoff based on unit basin storage volume, to achieve 80 percent (Santa Ana Permit area), or 90 percent (San Diego Permit area) or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbooks (1993), or

iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.[10]

Individual projects may evaluate and select any of the above approaches. Procedures, data specific to Orange County, and examples for applying approaches (i), (ii), and (iii) are presented herein.

The project used to demonstrate the calculations has the following characteristics:

- Located in the City of Irvine
- 400 ft above sea level
- Total project area, A_t, is 10 acres
- Impervious area, A_i, is 6 acres

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[9] This volume is not a single volume to be applied to all of Orange County. The size of the 85th percentile storm event is different for various parts of the County. The Permittees are encouraged to calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.8 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Permittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Permittees shall describe their method for using isopluvial maps in the model and local WQMPs.

[10] Under this volume criterion, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. If hourly rainfall data is selected, the Permittees shall describe the method for using hourly rainfall data to calculate the 85th percentile storm event in their local WQMPs.

Method (I):
The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.8 inch approximate average for the Orange County area below elevation of 1,000 feet and 0.95 in for projects above 1,000 feet elevation). The procedure is as follows:

1. ***Review the area draining to the proposed BMP***. Determine the percentage of the drainage area that is considered impervious. Impervious area includes paved areas, roofs, and other developed, non-vegetated areas. Non-vegetated, compacted soil areas shall be considered as impervious area.

2. ***Use Table A-1 to determine the Runoff Coefficient "C" for the drainage area***. The runoff coefficients from this table are intended only for use in this procedure for design of volumetric-based stormwater quality BMPs.

3. ***Find the depth of rainfall in inches of the 85th percentile storm event***.

   Use 0.80 inch for projects with 1,000 ft or less in elevation.

   Use 0.95 inch for projects with 1,000 ft or more in elevation.

4. ***Calculate the Water Quality Design Volume of the BMP***. The Water Quality Design Volume of the BMP is then calculated by multiplying the total rainfall by the BMP's drainage area and runoff coefficient. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Use of Unit Basin Storage Volume Curves Sizing a Dry Detention Basin

(Ai/At) * 100 = (6/10) * 100 = 60%

From Table A-1, for 60% impervious, C = 0.60

$V_b = C * I * A_t$

$V_b = 0.60 * (0.8 \text{ in}) * (10 \text{ ac}) * (1 \text{ ft}/12 \text{ in}) * (43{,}560 \text{ ft}^2/\text{acre})$

Size the BMP for V_b = 17,424 ft^3 and 48-hr drawdown

Note that this result is greater than that calculated using the 80% annual capture volume approach below (Method (iii)). This is in part because the capture volume method is based on a continuous simulation model using actual rainfall data and accounts for drawdown affects in the detention basin.

Method (II)

The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual and Report on Engineering Practice No. 87, (1998).

From WEF MOP 23/ASCE MREP 87:

$$P_0 = (a * C) * P_6$$

Where:

C = Runoff Coefficient = $0.858\ i^3 - 0.78\ i^2 + 0.774\ i + 0.04$

i = Watershed imperviousness ratio; namely, percent total imperviousness divided by 100 = 0.60

P_6 = mean storm precipitation volume, watershed inches. Using **Figure 5-3** in the manual, P6 = 0.65 inches

a = Regression constant from least-square analysis. Using **Table 5-4** in the manual for 48-hours drain time, a = 1.963

P_0 = Maximized detention volume using either the volume capture ratio as its basis, watershed inches

$C = 0.858\ (0.60)^3 - 0.78\ (0.60)^2 + 0.774\ (0.60) + 0.04 = 0.409$

$P_0 = (1.963 * 0.409) * 0.65$

$P_0 = 0.522$ inches

$V_b = 0.522$ (10 acre) (1 ft/12 in) (43,560 ft²/acre)

Size the BMP for V_b = 18,949 ft³ and 48-hour drawdown

Note that this result is greater than that calculated using the 80% annual capture volume approach below (Method (iii)). This is in part because the capture volume method is based on a continuous simulation model using actual rainfall data and accounts for drawdown affects in the detention basin.

Method (III) – Annual Runoff or Unit Basin Storage Volume Method

1. ***Review the area draining to the proposed BMP***. Determine the percentage of the drainage area that is considered impervious. Impervious area includes paved areas, roofs, and other developed, non-vegetated areas. Non-vegetated, compacted soil areas shall be considered as impervious area.

2. ***Use Table A-1 to determine the Runoff Coefficient "C" for the drainage area.*** The runoff coefficients from this table are intended only for use in this procedure for design of volumetric-based stormwater quality BMPs. Alternately, obtain the Runoff Coefficient from the drainage design calculations for the project.

3. ***Find the Unit Basin Storage Volume*** [11].

   *Use **Figure A-1** for projects with elevations less than 1,000 ft.*

   *Use **Figure A-2** for projects with 1,000 ft or more in elevation.*

   Enter **Figure A-1** or **A-2** on the vertical axis at 80% Annual Capture for projects in the Santa Ana Regional Board region or 90% Annual Capture for projects in the San Diego Regional Board region.

   Move horizontally to the right across the figure until the curve corresponding to the drainage area's runoff coefficient ("C") determined in Step 2 is intercepted. Interpolation between curves may be necessary. Move vertically down the figure for this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume along the horizontal axis. Recommended drawdown time for dry detention basins is 48 hours as discussed in the fact sheet.

   OR

   ***Figure A-3** provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) and 90% (San Diego Regional Board region) annual capture of runoff for values of "C" determined in Step 2 for projects with elevations less than 1000 ft.*

   ***Figure A-4** provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) and 90% (San Diego Regional Board region) annual capture of runoff for values of "C" determined in Step 2 for projects with elevations 1000 ft or higher.*

[11] Figures A-1 – A-4 are based on Precipitation Gages 4650 and 8243, located at Laguna Beach and Silverado Ranger Station, respectively. Both of these gages have data records of approximately fifty years of hourly readings and are maintained by the National Weather Service. Figures A-1 through A-4 are for use only in the permit areas specified in Santa Ana Regional Board Order No. R8-2002-0010, NPDES Permit No. CAS618030; and San Diego Regional Board Order No. R9-2002-0001, NPDES CAS0108740.

Enter the vertical axis of **Figure A-3** (or **Figure A–4**) with the "C" value from Step 2. Move horizontally across the figure until the line is intercepted. Move vertically down the figure from this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume along the horizontal axis.

4. ***Calculate the BMP volume***. The basin volume or basic volume of the BMP is then calculated by multiplying the Unit Basin Storage Volume by the BMP's drainage area. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Use of Unit Basin Storage Volume Curves Sizing a Dry Detention Basin

(Ai/At) * 100 = (6/10) * 100 = 60%

From **Table A-1**, for 60% impervious, C = 0.60

Use **Figure A-3**, and the line that provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) annual capture of runoff for values of "C" determined from **Table A-1**, and for projects with elevations less than 1000 ft.

Enter the vertical axis of **Figure A-3** with C = 0.60. Move horizontally across the figure until the line is intercepted. Move vertically down the figure from this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume (V_u) along the horizontal axis.

V_u = 0.46 inches

The volume of the basin is then $V_u \times A_t$

$V_b = V_u \times A_t$ = (0.46 in) (10ac) (1 ft/12 in) (43,560 ft^2/ac)

Size the BMP for V_b = 16,698 ft^3 and 48-hour drawdown

Figure A-1
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations <1,000 Feet

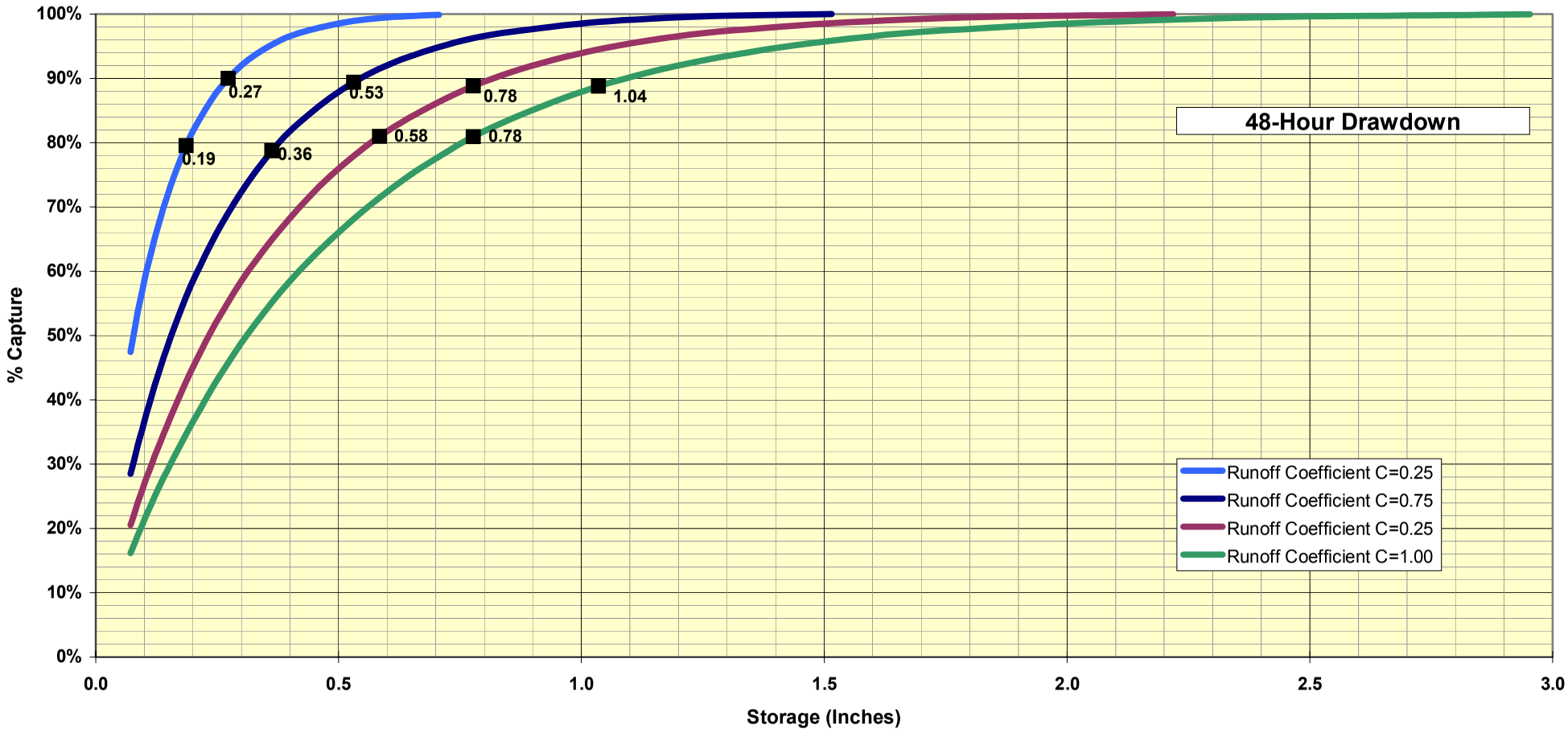


Figure A-2
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations >1,000 Feet

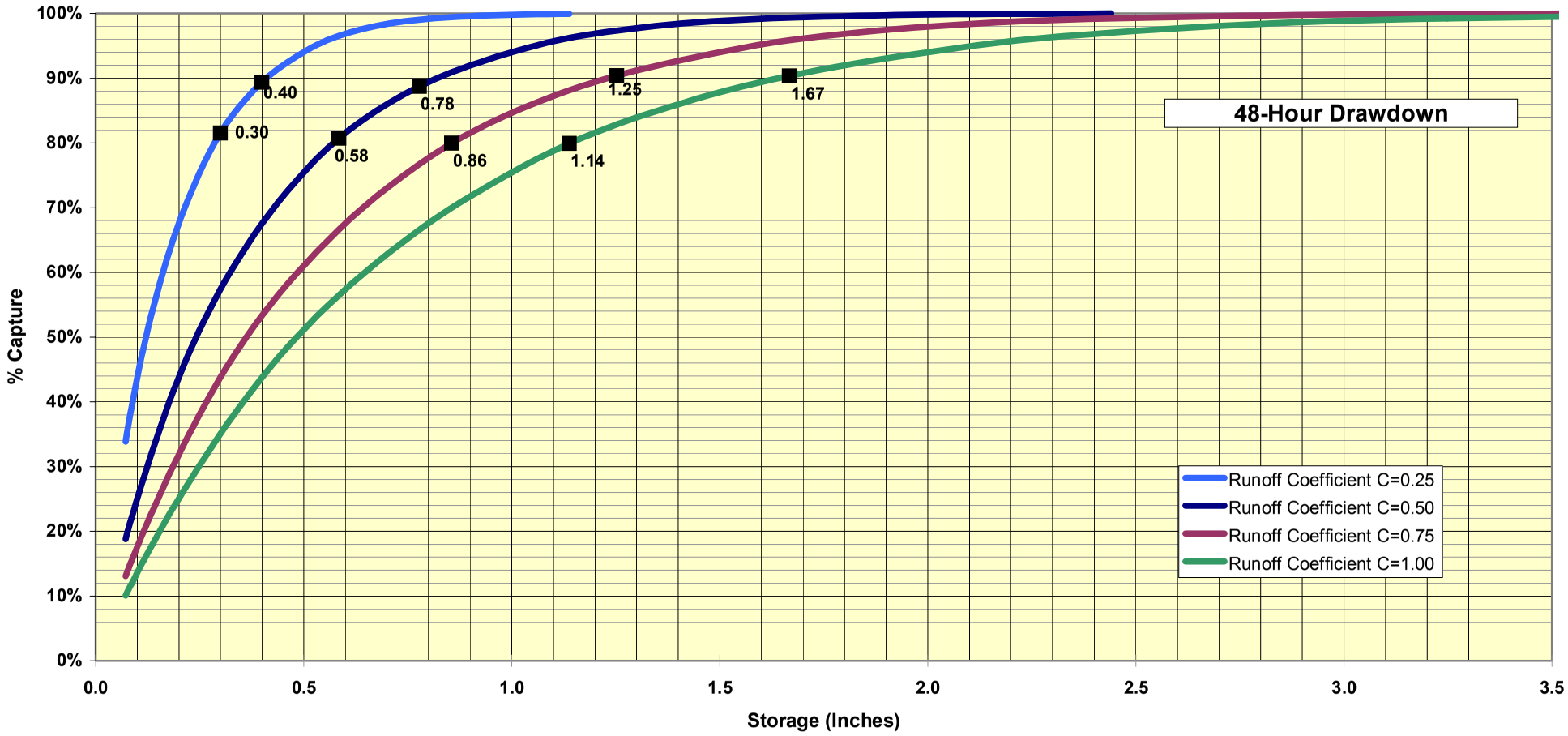


Figure A-3
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations < 1,000 Feet

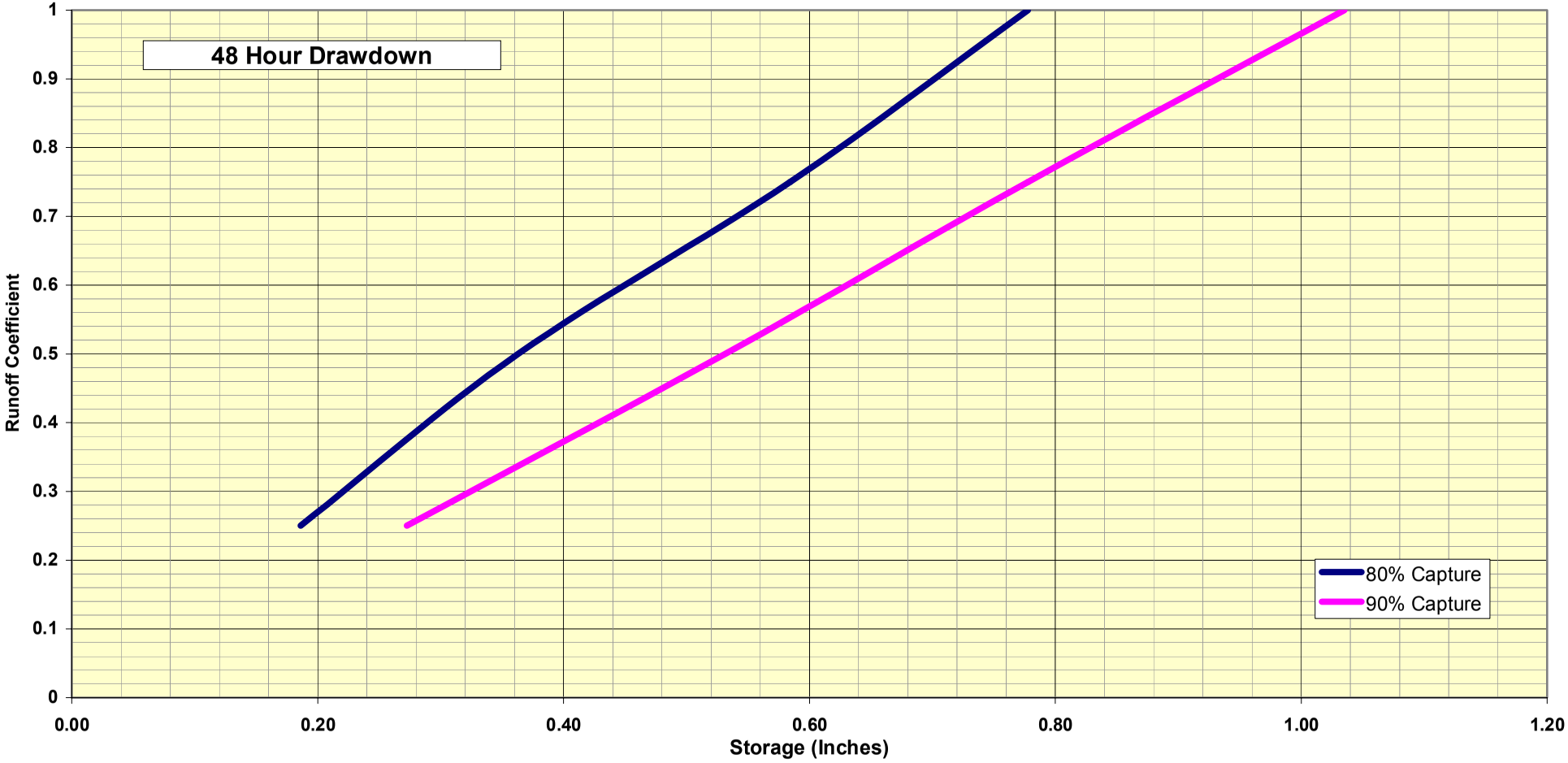
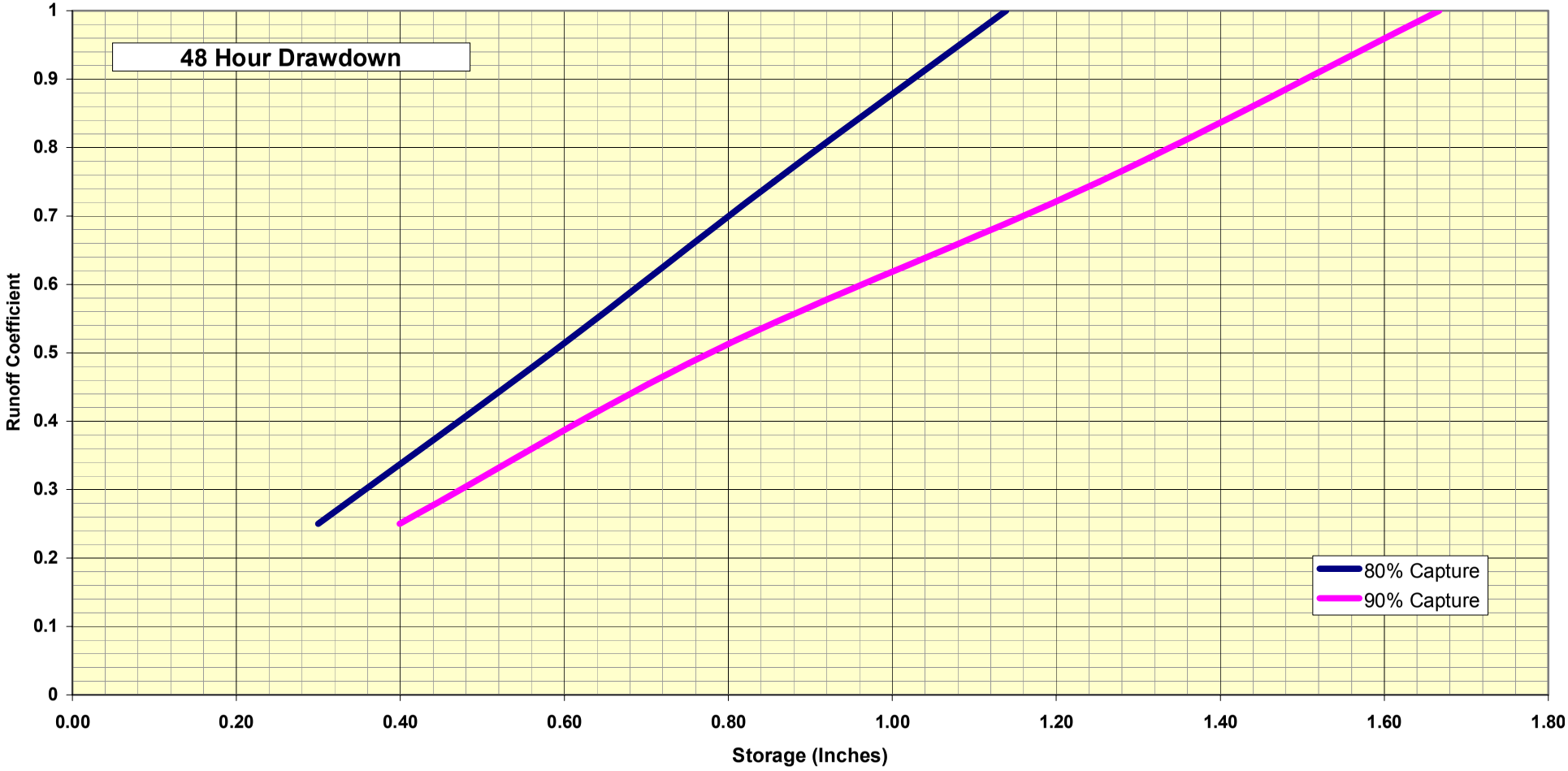


Figure A-4
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations >1,000 Feet



ATTACHMENT B – Suggested Resources

SUGGESTED RESOURCES	HOW TO GET A COPY
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
California Urban runoff Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of urban runoff BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975
Design and Construction of Urban Stormwater Management Systems, American Society of Civil Engineers (ASCE) Manuals and Reports on Engineering Practice No. 77/ Water Environment Federation (WEF) Manual of Practice FD-20, 1992.	
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different urban runoff-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Development Planning for Stormwater Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), (May 2000)	Los Angeles County Department of Public Works http://dpw.co.la.ca.us/epd/ or http://www.888cleanLA.com
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472

SUGGESTED RESOURCES	HOW TO GET A COPY
Guidance Manual for On-Site Stormwater Quality Control Measures, Sacramento Stormwater Management Program.	City of Sacramento Department of Utilities and County of Sacramento Water Resources Division. January 2000.
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Guide for BMP Selection in Urban Developed Areas (2001)	ASCE Envir. and Water Res. Inst. 1801 Alexander Bell Dr. Reston, VA 20191-4400 (800) 548-2723
Low-Impact Development Design Strategies - An Integrated Design Approach (June 1999)	Prince George's County, Maryland Department of Environmental Resource Programs and Planning Division 9400 Peppercorn Place Largo, Maryland 20774 http://www.co.pg.md.us/Government/DER/PPD/pgcounty/lidmain.htm
Maryland Stormwater Design Manual (1999) Presents guidance for designing urban runoff BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, Environmental Protection Agency (EPA-440/5-87-001).	
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of urban runoff BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000
National Stormwater Best Management Practices Database (2001)	Urban Water Resources Research Council of ASCE Wright Water Engineers, Inc. (303) 480-1700
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration	Report No. EPA/600/R-94/051, USEPA (1994).

SUGGESTED RESOURCES	HOW TO GET A COPY
Preliminary Data Summary of Urban runoff Best Management Practices (August 1999) EPA-821-R-99-012	http://www.epa.gov/ost/stormwater/
Reference Guide for Stormwater Best Management Practices (July 2000)	City of Los Angeles Urban runoff Management Division 650 South Spring Street, 7th Floor Los Angeles, California 90014 http://www.lacity.org/san/swmd/
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 (818) 623-4848 Fax (818) 753-4625
Site Planning for Urban Stream Protection, Department of Environmental Programs, Metropolitan Washington Council of Governments	
Start at the Source (1999) Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Stormwater, Grading and Drainage Control Code, Seattle Municipal Code Section 22.800-22.808, and Director's Rules, Volumes 1-4. (Ordinance 119965, effective July 5, 2000)	City of Seattle Department of Design, Construction & Land Use 700 5th Avenue, Suite 1900 Seattle, WA 98104-5070 (206) 684-8880 http://www.ci.seattle.wa.us/dclu/Codes/sgdccode.htm
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
The Stormwater Manager's Resource Center. This is a comprehensive site with information on BMP design and sizing. http://www.stormwatercenter.com	
Stormwater Pollution Control, Municipal, Industrial and Construction NPDES Compliance, Second Edition. Roy D. Dodson, P.E., 1999.	
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Urban runoff Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150

SUGGESTED RESOURCES	HOW TO GET A COPY
The Practice of Watershed Protection by Thomas R. Shchuler and Heather K. Holland	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
Urban Runoff Quality Management, American Society of Civil Engineers (ASCE) Manual and Report on Engineering Practice No. 87/Water Environment Federation (WEF) Manual of Practice No.23, 1998.	
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277

ATTACHMENT C
Orange County Sanitation District, Guidelines for Preventing Sewer Discharge of Surface Runoff through Wash Pads

Purpose and Scope

These guidelines are established pursuant to Section 203 of the Districts' Wastewater Discharge Regulations (Ordinance) as amended February 7, 1992. Section 203 provides that

No person shall discharge groundwater, surface runoff, or subsurface drainage to the Districts' sewerage facilities except as provided herein. Pursuant to section 305, et. Seq., the Districts may approve the discharge of such water only when no alternate method of disposal is reasonably available or to mitigate an environmental risk or health hazard.

The Guidelines presented herein are intended for the implementation of this policy as it applies to preventing surface runoff from entering the Districts' sewerage system through exposed wash pads.

Application

Two sources from which surface runoff can potentially enter the Districts' sewerage system are the exposed area around the wash pad and the wash pad itself.

Exposed Area Around the Wash Pad: Appropriate measures must be taken to insure that surface runoff from the exposed area around the wash pad (e.g. parking lot, storage areas) does not enter the sewer. Surface runoff must be directed away from the sewer. Appropriate measures include grading the open area to redirect surface runoff to the storm drain; berming around the wash pad; or trenching around the wash pad with grating over the trench, and directing the collected water to a storm drain in accordance with stormwater discharge requirements.

The Wash Pad: Appropriate measures must be taken to insure that surface runoff from the wash pad itself does not enter the sewer. Provided that local regulations are satisfied, roofing will be required for all exposed wash pads, which have a total area exceeding 150 square feet. If the roof structure does not include walls, then the roofs overhang must extend a minimum of 20 percent of the roofs height. All roof drains must be routed to a storm drain.

Where rooting of exposed areas is infeasible or prohibited by local regulations, the Districts may accept the use of an automated surface runoff diversion system. [Note: This diversion system will not substitute for the appropriate measures cited above for surface runoff from the exposed area around the wash pad]. In cases where a diversion system is installed, only the first 0.1-inch of rainwater will be allowed to enter the sewer. After the first 0.1 inch of rainfall, excess rainwater must be diverted to an appropriate drainage system by use of an automated diversion system. The diversion system is subject to acceptance by the Districts. Manual methods of diversion (e.g. manual gates, removable plugs) are not acceptable. Companies are responsible for maintaining the automated diversion system in proper operating condition to ensure that no excess surface runoff from the wash pad is discharged to the sewer.

ATTACHMENT D

ASCE/EPA Technical Memorandum titled "Development of Performance Measures"

ATTACHMENT E – DEFINITIONS

"Attached Residential Development" means any development that provides 10 or more residential units that share an interior/exterior wall. This category includes, but is not limited to: dormitories, condominiums and apartments.

"*Automotive Repair Shop*" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Commercial and Industrial Development" means any development on private land that is not exclusively heavy industrial or residential uses. The category includes, but is not limited to: mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, automotive dealerships, commercial airfields, and other light and heavy industrial complexes or facilities.

"Commercial and Industrial Development greater than 100,000 square feet" means any commercial or industrial development with a project footprint of at least 100,000 square feet.

"Detached Residential Development" means any development that provides 10 or more freestanding residential units. This category includes, but is not limited to: detached homes, such as single-family homes and detached condominiums.

"*Directly Connected Impervious Area (DCIA)*" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable vegetated land area (e.g., lawns).

"Environmentally Sensitive Areas" means areas that include, but are not limited to, all Clean Water Act 303(d) impaired water bodies ("303[d] water bodies"); areas designated as an "Area of Special Biological Significance" (ASBS) by the State Water Resources Control Board (1990 Water Quality Control Plan for Ocean Waters of California [Ocean Plan] and Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated as having a RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments), or areas designated as preserves or their equivalent under the Multiple Species Conservation Program (MSCP) within the Cities and County of Orange. The limits of Areas of Special Biological Significance are those defined in the 1990 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and the Water Quality Control Plan for the San Diego Basin (1994 and amendments). Environmentally sensitive area is defined for the purposes of implementing WQMP requirements, and does not replace or supplement other environmental resource-based terms, such as "Environmentally Sensitive Lands," employed by Permittees in their land development review processes. As appropriate, Permittees should distinguish between environmentally sensitive area and other similar terms in their local WQMP's.

"Hillside" means lands that have a natural gradient of 25 percent (4 feet of horizontal distance for every 1 foot of vertical distance) or greater and a minimum elevation differential of 50 feet, or a natural gradient of 200 percent (1 foot of horizontal distance for every 2 feet of vertical distance) or greater and a minimum elevation differential of 10 feet.

"Hillside development greater than 5,000 square feet" means any development that would create more than 5,000 square feet of impervious surfaces in hillsides with known erosive soil conditions.

"Infeasibility Waivers" means a Permittee-issued waiver from requirements for Treatment BMPs. The waiver requires a project proponent demonstrate Treatment BMP infeasibility and the Permittee to notify the Executive Officer of the applicable Regional Board of the waiver.

"Infiltration" means the downward entry of water into the surface of the soil.
"Municipal Storm Drain System" means public drainage facilities by which stormwater may be conveyed to Receiving Waters, such as: natural drainages, ditches, roads, streets, constructed channels, aqueducts, storm drains, pipes, street gutters, or catch basins.

"Natural Flow Regime" means the pre-development hydrologic conditions within a stream.

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, or for business or commerce.

"Projects Discharging to Receiving Waters within Environmentally Sensitive Areas" means all development and significant redevelopment that would create 2,500 square feet of impervious surfaces or increase the area of imperviousness of a project site to 10% or more of its naturally occurring condition, and either discharge urban runoff to a receiving water within an environmentally sensitive area (where any portion of the project footprint is located within 200 feet of the environmentally sensitive area), or discharge to a receiving water within an environmentally sensitive area without mixing with flows from adjacent lands (where the project footprint is located more than 200 feet from the environmentally sensitive area).

"Project Feature" means a project component or subpart that in and of itself, meets priority project criteria. For example, a greater than 5000 sq. ft. parking lot within a non-priority project.

"Project Footprint" means the limits of all grading and ground disturbance, including landscaping, associated with a project.

"Receiving Waters" means surface bodies of water, that receive discharges from new development and redevelopment projects, either directly, or indirectly through municipal storm drain systems. Surface bodies of water include naturally occurring wetlands, streams (perennial, intermittent and ephemeral [exhibiting bed, bank, and ordinary high water mark]), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean. The Permittee shall determine the definition for wetlands and the limits thereof for the purposes of this definition, provided the Permittee definition is as protective as the Federal definition utilized by the United States Army Corps of Engineers (US COE) and the United States Environmental Protection Agency (US EPA). Constructed wetlands for treatment purposes are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs such as detention and retention basins are not considered receiving waters under this definition, unless the BMP was originally constructed within receiving waters.

"Residential Development" means any development on private land that provides living accommodations for one or more persons. This category includes, but is not limited to: single-family homes, multi-family homes, condominiums, and apartments.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

"Significant Redevelopment" means development that would create or add at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint; addition to or replacement of a structure; replacement of an impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces and new sidewalk construction, pedestrian ramps, or bike lane on public and private existing roads;. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Significant redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots (if no additional impervious area is added); pedestrian rampsand replacement of damaged pavement.

"Site Design BMP" means any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered Site Design BMPs.

"Source Control BMP (both structural and non-structural)" means land use or site planning practices, or structures that aim to prevent urban runoff and stormwater pollution by reducing the potential for contamination at the source of pollution. Source Control BMPs minimize the contact between pollutants and urban runoff. Examples include roof structures over trash or material storage areas, and berms around fuel dispensing areas.

"Stormwater Best Management Practice (BMP)" means any schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, structural treatment BMPs, and other management practices to prevent or reduce to the maximum extent practicable the discharge of pollutants directly or indirectly to receiving waters. Stormwater BMPs also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. This Model WQMP groups stormwater BMPs into the following categories: Site Design, Source Control, and Treatment Control (pollutant removal) BMPs.

"Streets, Roads, Highways, and Freeways" means any project that is not part of a routine maintenance activity, and would create a new paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles. For the purposes of WQMP requirements, Streets, Roads, Highways, and Freeways do not include trenching and resurfacing associated with utility work; applying asphalt overlay to existing pavement; new sidewalk, pedestrian ramps, or bike lane construction on existing roads; and replacement of damaged pavement.

"Treatment Control (Structural) BMP" means any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.